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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/673,702	10/19/2000	Christer Fahraeus	0460/63413/N	3982

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EXAMINER

CHEN, WENPENG

ART UNIT PAPER NUMBER

2624

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/673,702		FAHRAEUS ET AL.	
	Examiner		Art Unit	
	Wenpeng Chen		2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/19/2004 has been entered.

Examiner's responses to Applicant's remark

2. Applicants' arguments filed on 8/19/2004 have been fully considered.
3. The arguments with regard to incorporation of Swedish Patent Application No. 9704924-1 are persuasive, because the Swedish Patent Application disclosed an alternate way of matching images that the Applicants admitted to be not essential to the present application. The objection set forth in paper #7 is withdrawn.
4. The arguments with respect to all art rejections set forth in paper #7 are not persuasive as explained below.
 - a. Applicants' argument -- With regard to Claims 1, 19 and 30, (1) The motivation for combining Perona and Taguchi identified in the Office Action is not supported by Taguchi's column 1, lines 37-47 as set forth the Office Action. The problem identified by the Office Action

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as the motivation for combining references does not exist, and thus cannot be the motivation for combining Perona and Taguchi. (2) Perona images an entire writing surface. Taguchi's system works in a different manner and provides only a limited field of view for an image sensor. This limited field of view does not encompass the entire writing surface, and therefore Taguchi could not provide the x, y coordinate information required by Perona's system to operate. Therefore, even if a motivation to combine these references could be identified, the resulting combination would non-functional and would not render the invention required by claim 1 obvious.

b. Examiner's answer -- Taguchi points out explicitly the desire for recording, reproducing, and displaying handwriting in column 1, lines 6-19. As the Examiner points out that the motivation for combination is "to have a system that can verify hand-written information including a signature and *also can display the captured image of hand-written contents to facilitate human interaction and verification.*" Such a desire is also known to one of ordinary skill in the signature verification art. Applicants correctly point out that Perona's system produces and processes an image of a frame size. Because a sequence of whole images is captured, displaying a whole image does not have a clean captured hand-written contents. Furthermore, without combining parts of written contents from the sequence of images, even some parts of written contents are extracted, the extracted parts cannot be displayed to show the whole signature as pointed out by Taguchi in column 1, lines 37-47. To achieve "*displaying the captured image of hand-written contents to facilitate human interaction and verification,*" one has to modify Perona's optics; therefore there is a need to replace Perona's pen 104 and camera 100 with Taguchi's recording means (in Fig. 2 of Taguchi.)

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Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 48-51 and 56-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the following reasons.

There are insufficient antecedent bases for the following limitations.

- Claim 48 recites the limitation "the surface pattern" in line 7.
- Claim 56 recites the limitation "the surface pattern" in line 7.
- Claim 59 recites the limitation "the surface pattern" in line 8.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-11, 13-15, 19-26, 29-39, 41-43, and 47-60 are rejected under 35 U.S.C. § 103 as being unpatentable over Perona et al. (US patent 6,044,165 cited previously) in view of Taguchi et al. (US patent 5,748,808 cited previously.)

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c. For Claims 1, 3-11, 13-15, 19-26, 29-39, 41-43, and 47, Perona teaches a device for recording hand-written information in the form of characters, symbols, and calligraphy defined by a hand movement comprising:

- recording means to generate trace of hand-written information and store a description in digital format of how a pen's movement generates the hand-written information; (column 3, line 27 to column 4, line 30; column 8, lines 12-54)

- wherein said description comprises turning indications, indicating how the recording means have been turned between the recording of two images; (column 8, lines 33-44; The curvature and points with velocity below a threshold contain turning indications.)

- wherein the device determines the speed at which the recording means have been moved between the recording of two images; (column 1, lines 35-45; column 8, lines 33-44; The velocity contains a x speed and y speed.)

- wherein said device is adapted to compare the speed with pre-recorded speed data for checking the authenticity of the inputted information; (column 1, lines 35-45; one of criteria for signature verification is speed.)

- wherein the hand-written information comprises characters and wherein the image-processing means are further adapted to identify the characters with the aid of the description in digital format and to store the identified characters in character-coded format. (column 1, lines 35-45; column 3, lines 47-65; units 140 and 150 of Fig. 1; The text displayed after recognition is in character-coded format.)

However, Perona does not teach the features related to (1) the recited recording means to record a plurality of images with partially overlapping contents and (2) the recited image

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processing means to determine the relative positions of the images with the aid of the partially overlapping contents.

Taguchi teaches a device for recording hand-written information in the form of characters, symbols, and calligraphy defined by a hand movement comprising:

-- recording means which are adapted to be moved by a hand which carried out the hand movement and to record a plurality of images with partially overlapping contents while the recording means are being moved; (Figs. 1-4; column 13, line 50 to column 14, line 54; Images are overlapped in cells, acts, scenes as shown in Figs. 3, 6, 13, 16-17. Component 1 of Fig. 1 is the recording means.)

-- image processing means which are adapted to determine the relative positions of the images with the aid of the partially overlapping contents for providing a description in digital format of how the recording means have been moved, wherein the description includes movement vectors; (Figs. 1-4; column 13, line 50 to column 14, line 54; column 14, lines 31-37; column 18, lines 1-16; column 21, lines 11-38 and 49-58; Component 10 of Fig. 1 is the image processing means. For example, the positional relationship between two continuous cells is a movement vector because it indicates how a cell is moved relative to a previous cell.)

-- wherein the description comprises a plurality of movement vectors each indicating how the recording means have been moves between the recording of two images; (column 14, lines 31-37; column 18, lines 1-16; column 21, lines 11-38 and 49-58; Movement vectors between cells, acts or scenes are detected. Each vector corresponds to two images of cells, acts or scenes as explained above.)

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-- wherein said description comprises turning indications, indicating how the recording means have been turned between the recording of two images; (Figs. 3-4 and 16-17 show that the movement vectors indicate the turning of the hand-writing device.)

-- wherein said device has light-sensitive sensor means with a two-dimensional sensor surface recording the images; (column 13, lines 50-67; the area CCD sensor 4)

-- wherein said image-processing means are adapted to determine the relative position of the images both horizontally and vertically; (column 15, lines 15-40; The positional relationship is determined in both x and y directions.)

-- wherein the recording means are adapted to be directed, while being moved, at a surface which is imaged with the aid of said plurality of images; (column 11, lines 43-60; The recording means is moved on the top of a paper.)

-- tracing means for indicating on the surface the movement of the recording means; (The parts including lead 2 of Fig. 2 is a tracing means.)

-- wherein the recording means and the image-processing means are arranged in a common casing which adapted to be moved by the hand carrying out the hand movement; (Fig. 2)

-- wherein the recording means are arranged in a first casing and the image processing means in a second casing; (column 12, lines 1-4)

-- wherein the image-processing means comprise a processor device; (microcomputer 5 of Fig. 1)

-- display means for reproducing the hand-written information based on the description of how the recording means have moved. (column 12, lines 5-15; Figs. 1 and 8)

It is desirable to have a system that can verify hand-written information including a signature and also can display the captured image of hand-written contents to facilitate human interaction and verification. Because the separation of the pen and camera as shown in Fig. 1, Perona's system cannot generate the image of the hand-written contents in a clean fashion without showing the image of the hand that writes the contents as pointed out by Taguchi in column 1, lines 37-47. It would have been obvious to one of ordinary skill in the art, at the time of the invention, at least to replace Perona's pen 104 and camera 100 with Taguchi's recording means (in Fig. 2 of Taguchi) because the combination provides a better displaying capability of a captured image of hand-written contents. Because the information associated with image of hand-written contents captured by Taguchi's recording means is subsequently analyzed by Perona's system, the combination thus teaches:

- wherein said device is adapted to determine, on the basis of the overlapping contents of the images, the speed at which the recording means have been moved between the recording of two images;

- wherein said device is adapted to compare the speed with pre-recorded speed data for checking the authenticity of the inputted information;

- wherein the hand-written information comprises characters and wherein the image-processing means are further adapted to identify the characters with the aid of the description in digital format and to store the identified characters in character-coded format.

The above passages of Perona and Taguchi also teach the corresponding methods of Claims 19-21, 23-26 and 29 and the corresponding devices of Claims 30-39, 41-43, and 47.

d. For Claims 56-58, the combination of Perona and Taguchi teaches also:

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-- providing a surface having a pattern; (column 3, lines 27-35, Perona; Sheet of paper 102 inherently has pattern such as texture of the paper. column 22, lines 18-22, Taguchi; paper having ruled lines)

-- moving the imaging device with a hand which is carrying out the hand movement relative to the surface while recording with the imaging device a plurality of images of the surface pattern with partially overlapping contents. (The recorded partially overlapping image contains the pattern of the paper inherently.)

As discussed above with regard to Claims 1, 3-11, 13-15, 19-26, 29-39, 41-43, and 47, the combination of Perona and Taguchi also teaches:

-- providing an imaging device;

-- providing a description in digital format of how the imaging device has been moved by determining the relative positions of the images with the aid of the partially overlapping contents; (Taguchi's pen captures image of the lines in Figs. 3 and 4 and the corresponding neighboring areas of the lines. The neighboring areas inherently contain the pattern of the paper such as the texture or any preexisting dots. The partially overlapping contents contain both the neighboring pattern and the newly created written trace.)

-- storing the hand-written information by storing the description of how the device has been moved;

-- displaying the handwritten information based on the description.

e. For Claims 48-55 and 59-60, the combination of Perona and Taguchi teaches also:

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-- providing a surface having a pattern that can be a preexisting pattern; (column 3, lines 27-35, Perona; Sheet of paper 102 inherently has pattern such as texture of the paper. column 22, lines 18-22, Taguchi; paper having ruled lines)

-- determining the relative positions of the images is performed in parallel with said step of providing a description format. (As shown in column 14 22 to column 16, line 54 the matching and storing of the motion information are performed in the period of time. One cannot say that the matching step is performed before or after storing all of the motion information. Therefore, they are performed in parallel.)

Taguchi's pen captures image of the lines in Figs. 3 and 4 and the corresponding neighboring areas of the lines. The neighboring areas inherently contain the pattern of the paper such as the texture or any preexisting lines. The partially overlapping contents contain both the neighboring pattern and the newly created written trace. During matching operation of partially overlapping images, both the newly created written trace and its neighboring pattern are matched to determine the displaced movement. Therefore, the combination teaches the feature "providing a description in digital format of how the imaging device has been moved based on the relative positions the surface pattern in the partially overlapping images", because the degree of matching also depends on the relative positions the surface pattern in the partially overlapping images. In the interview, the Examiner's representative indicated that the present application could perform matching operation without using any created written trace. Claims 48 and 52 are not defined with the feature of " matching operation without using any created written trace."

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With the above explanation and the discussion above with regard to Claims 1, 3-11, 13-15, 19-26, 29-39, 41-43, and 47, the combination of Perona and Taguchi also teaches other limitations recited in Claims 48-55 and 59-60.

9. Claims 12 and 40 are rejected under 35 U.S.C. § 103 as being unpatentable over Perona et al. (US patent 6,044,165 cited previously) in view of Taguchi et al. (US patent 5,748,808 cited previously), and further in view of Bennett et al. (US patent 5,051,736 cited previously.)

The combination of Perona and Taguchi teaches the parental claims of the above listed claims. However, it does not teach the feature related with the recited illumination means.

Bennett teaches a writing pen for inputting hand-written information comprising:

-- an illumination means which projects light onto the surface. (light source 12 of Fig. 2)

It is desirable to be able to record hand-written information even under low-room-lighting condition. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to add an illumination means taught by Bennett to Taguchi's recording means in the system taught by the combination of Perona and Taguchi because the overall combination broadens application of the system in various lighting conditions.

10. Claims 16-18, 27-28, and 44-46 are rejected under 35 U.S.C. § 103 as being unpatentable over Perona et al. (US patent 6,044,165) in view of Taguchi et al. (US patent 5,748,808 cited previously), and further in view of Tano et al. (US patent 5,850,058 cited previously.)

The combination of Perona and Taguchi teaches the parental claims of the above listed claims. However, it does not teach the features related to the recited (1) operational mode and (2) wireless communication.

Tano teaches a writing pen for inputting hand-written device comprising:

-- wherein said device is adjustable to an operational mode which it is adapted to record predefined information, preferably located on an information carrier, by imaging the information with the aid of a plurality of images with partially overlapping contents; (column 5, lines 1-7; The switch 112 selects the operational mode for capturing images.)

-- wherein said device is adjustable to an operational mode in which it is adapted to image an object located at a distance from the device; (column 13, lines 30-49; The pen can image an object at a distance and then transfer data back to a processor.)

-- a transceiver for wireless communication with an external unit. (column 13, lines 30-49; radio communication shown in Figs. 12-13)

It is desirable to have flexibility of (1) inputting various data including hand-written information and (2) processing the data locally and remotely. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Tano's teaching to include capability of recording various data and remote communication to the system taught by the combination of Perona and Taguchi, in which a switch for selecting operational mode and a radio communication are added, because the overall combination provides operational flexibility of the system in various environments.

Conclusion

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Primary Examiner
Art Unit 2624

November 3, 2004

